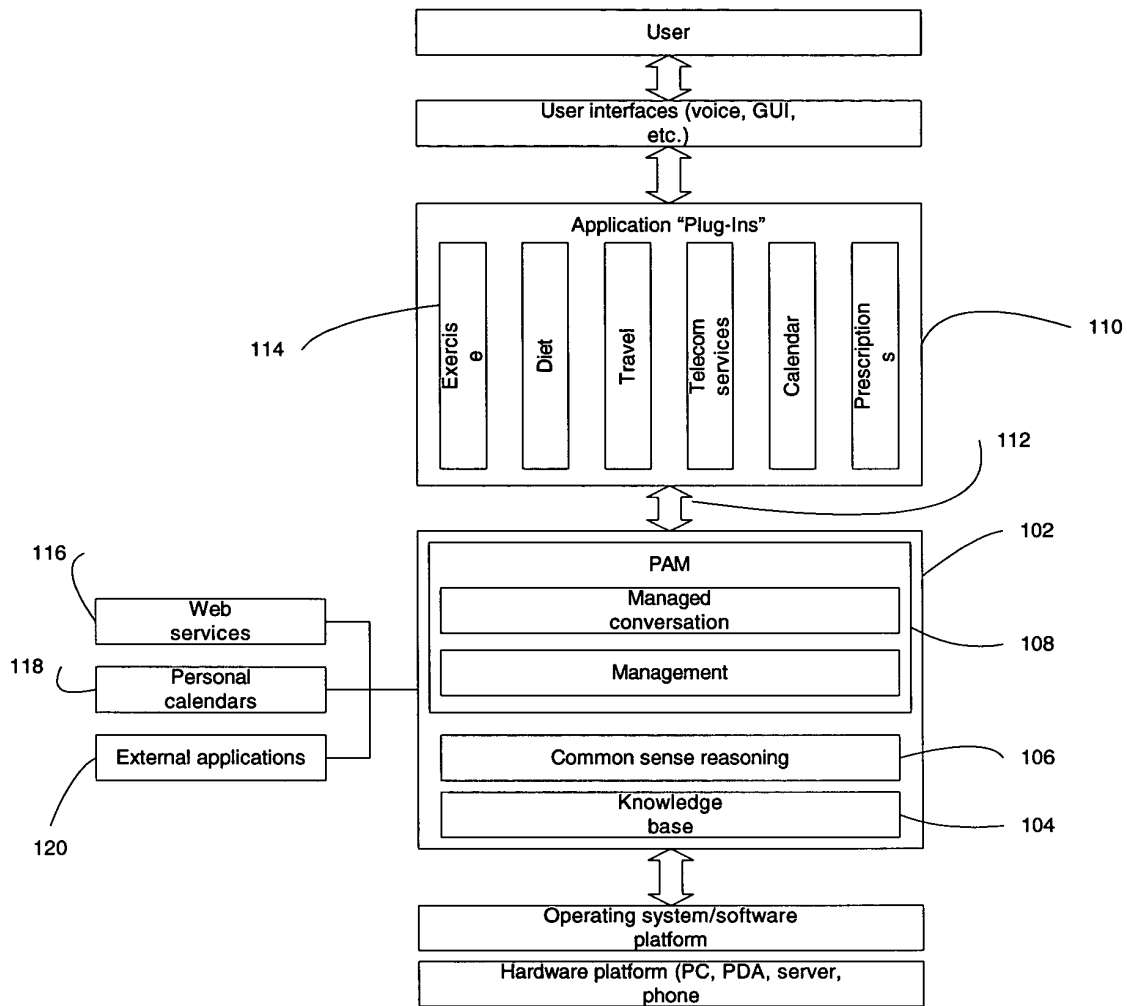
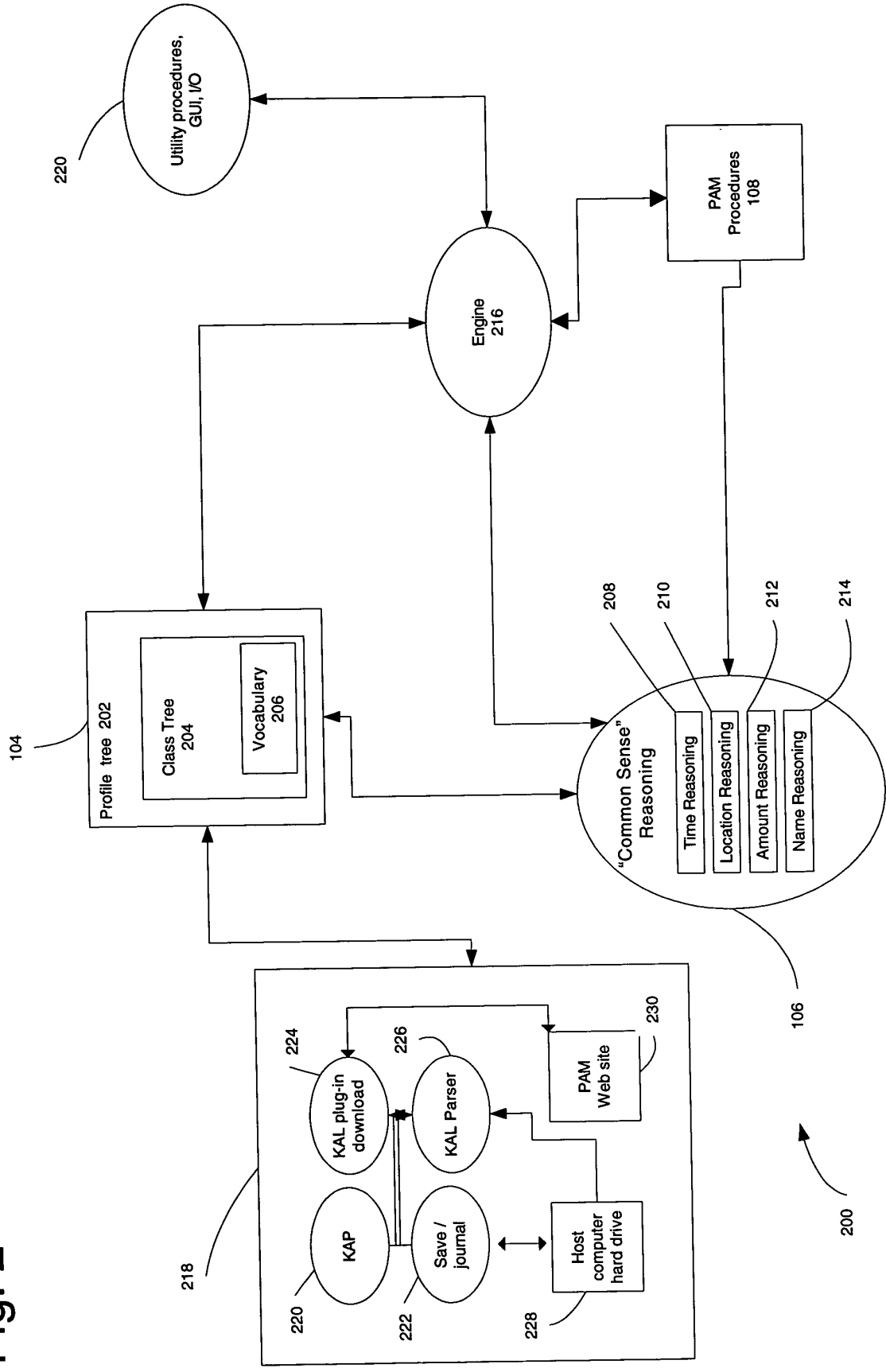


Figure 1



Exemplary architecture

Fig. 2



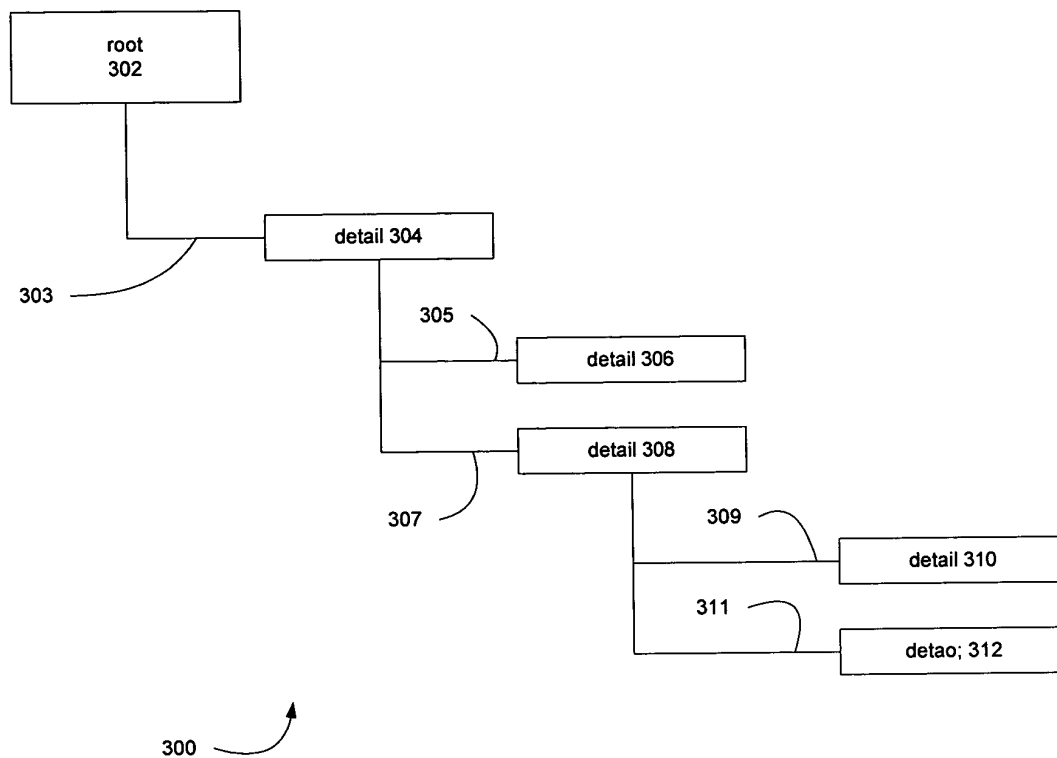
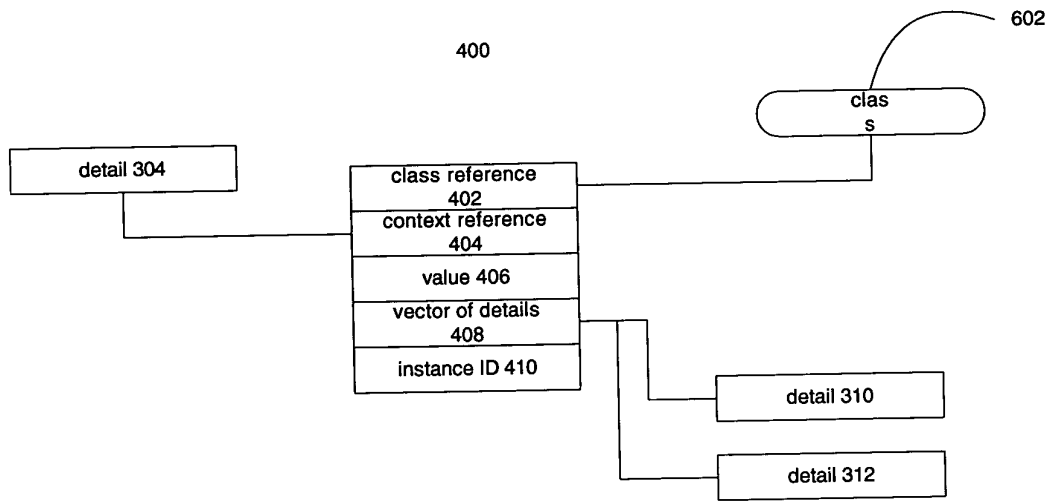


Fig. 3

Figure 4A



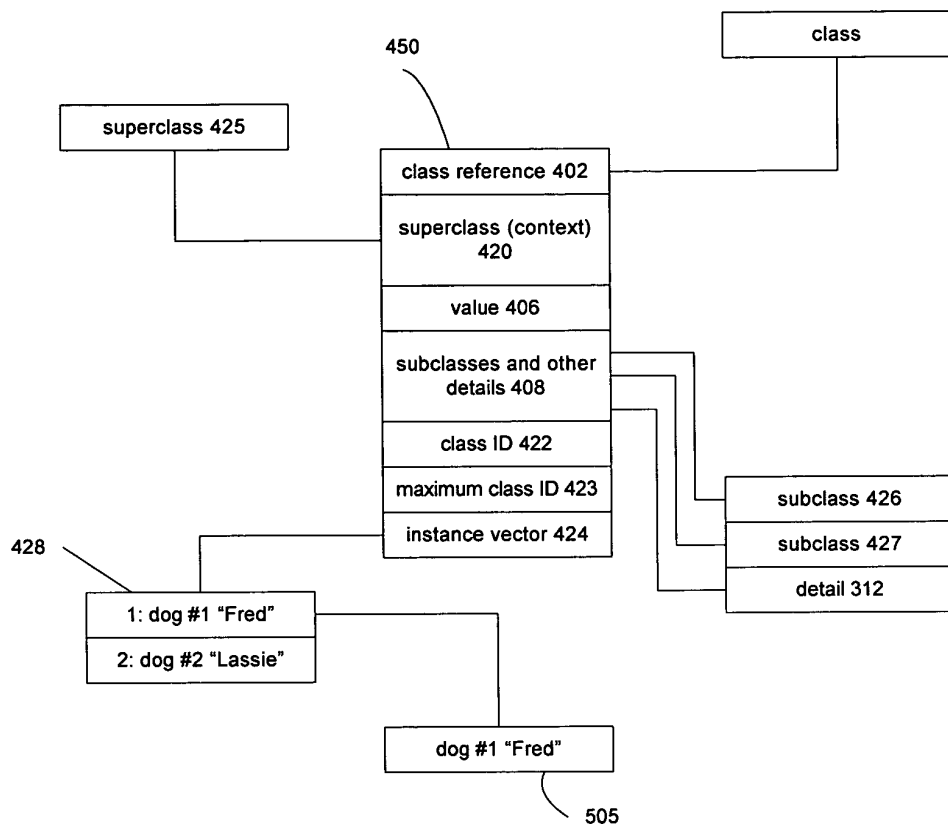


Fig. 4B

Figure 5A

```

    root "PAM profile":
      root "PAM class tree":
602      thing::
604      name::
605      synonym::
        type::
          string::
          number@type::
606      color::
515      qualifier: color
608      black::
609      red::
610      size::
        qualifier: size
612      big::
614      owner::
616      class::
618      word class::
620      primary word class::
622      secondary word class::
624      qualified class::
626      string qualified class::
628      number qualified class::
630      color qualified class::
632      size qualified class::
        living thing::
          animal::
634          mammal::
636          person::
638          canid::
640          dog::
516          synonym: "hound"
642          black dog::
644          big black dog::
645          red dog::
646          domestic animal::
648          pet::
501          inverse relation: owner
502      root "User data":
503      person #1 "Alan Turing":
504      pet: dog #1 "Fred"
505      dog #1 "Fred":
508      owner: person #1 "Alan Turing"
506      color: black
507      size: big
510      class: show dog
```

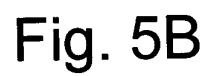


Fig. 5B

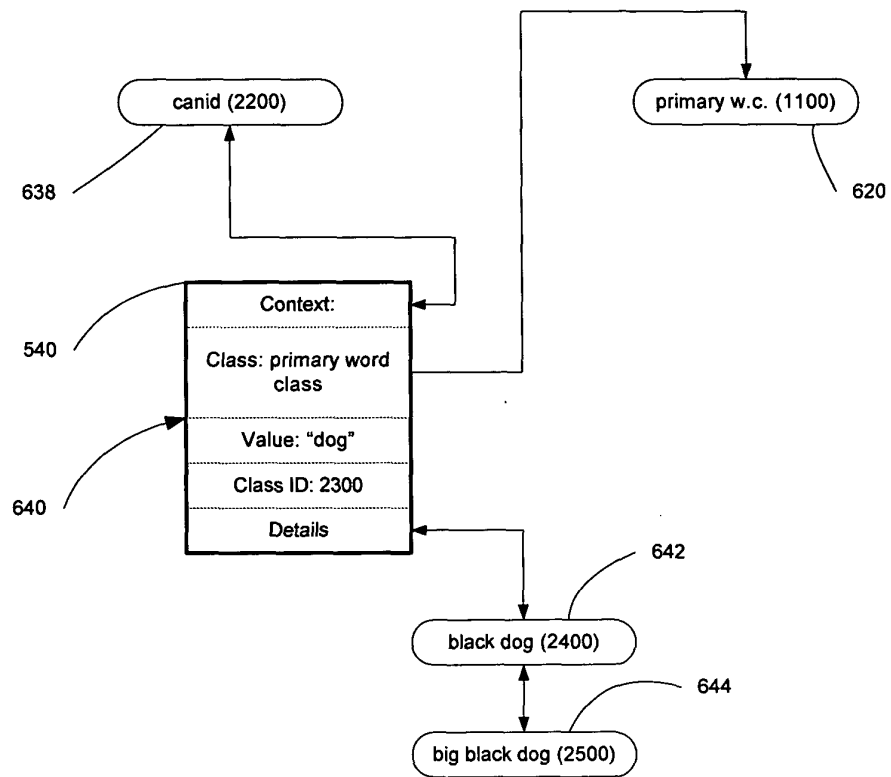


Fig. 5C

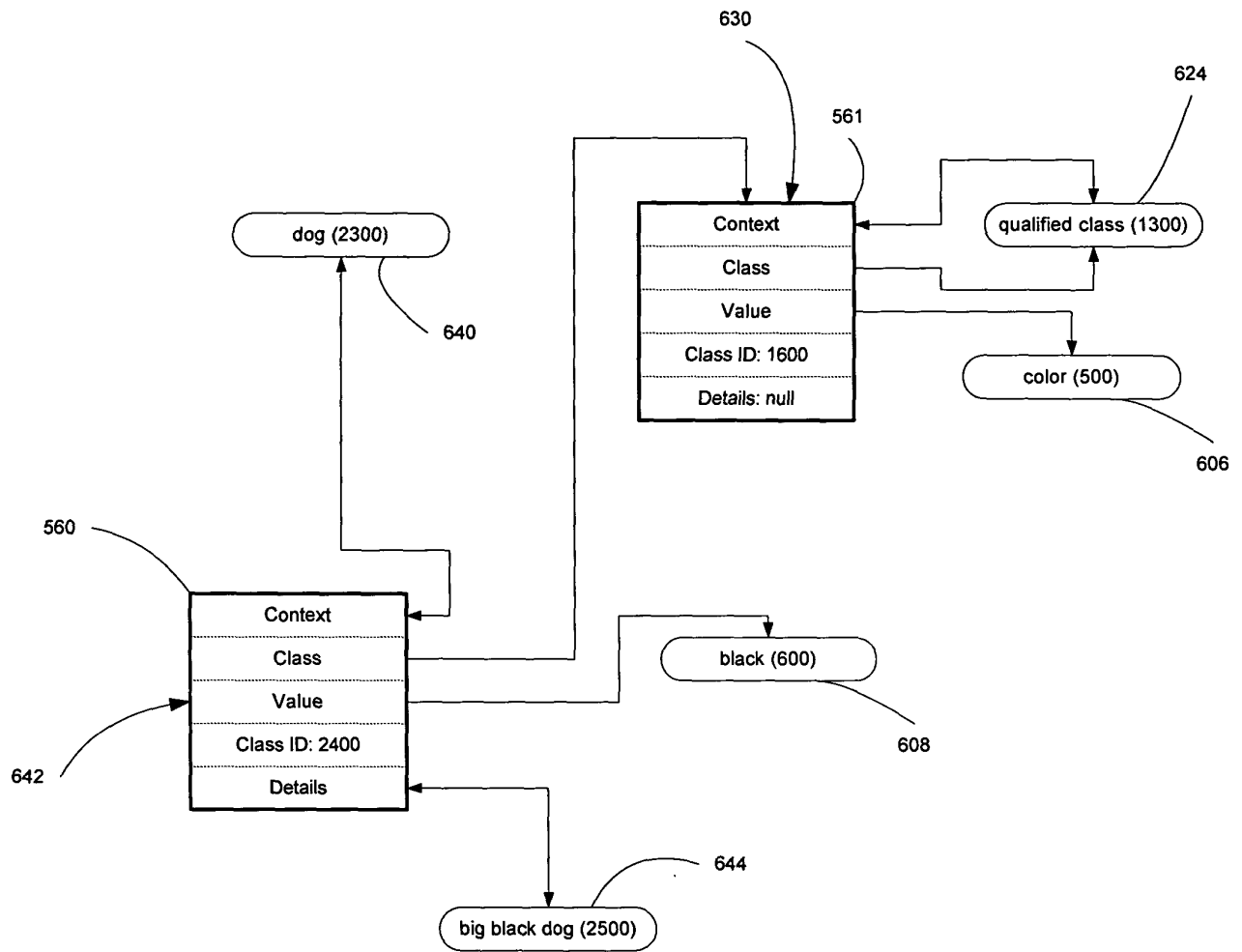


Fig. 5D

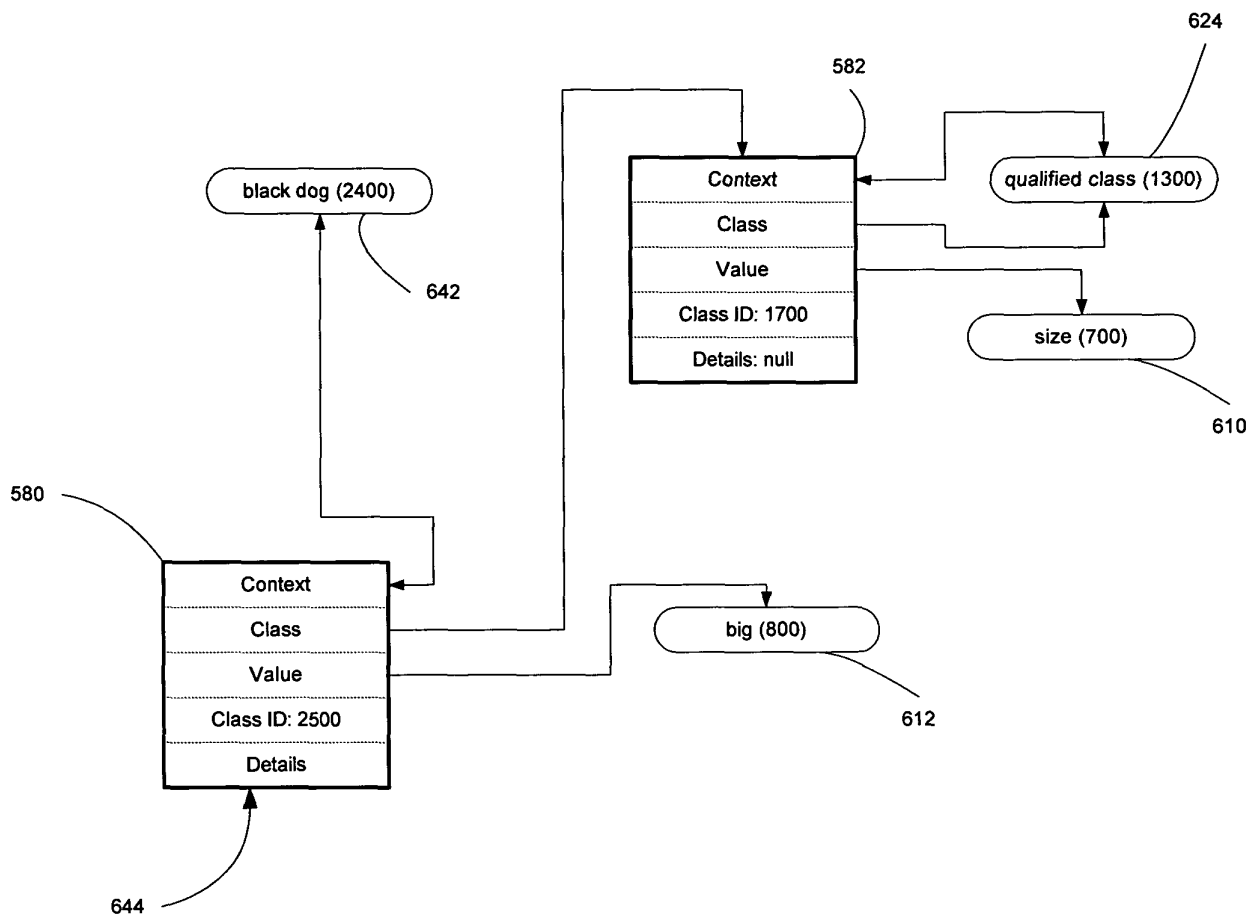


Fig. 5E

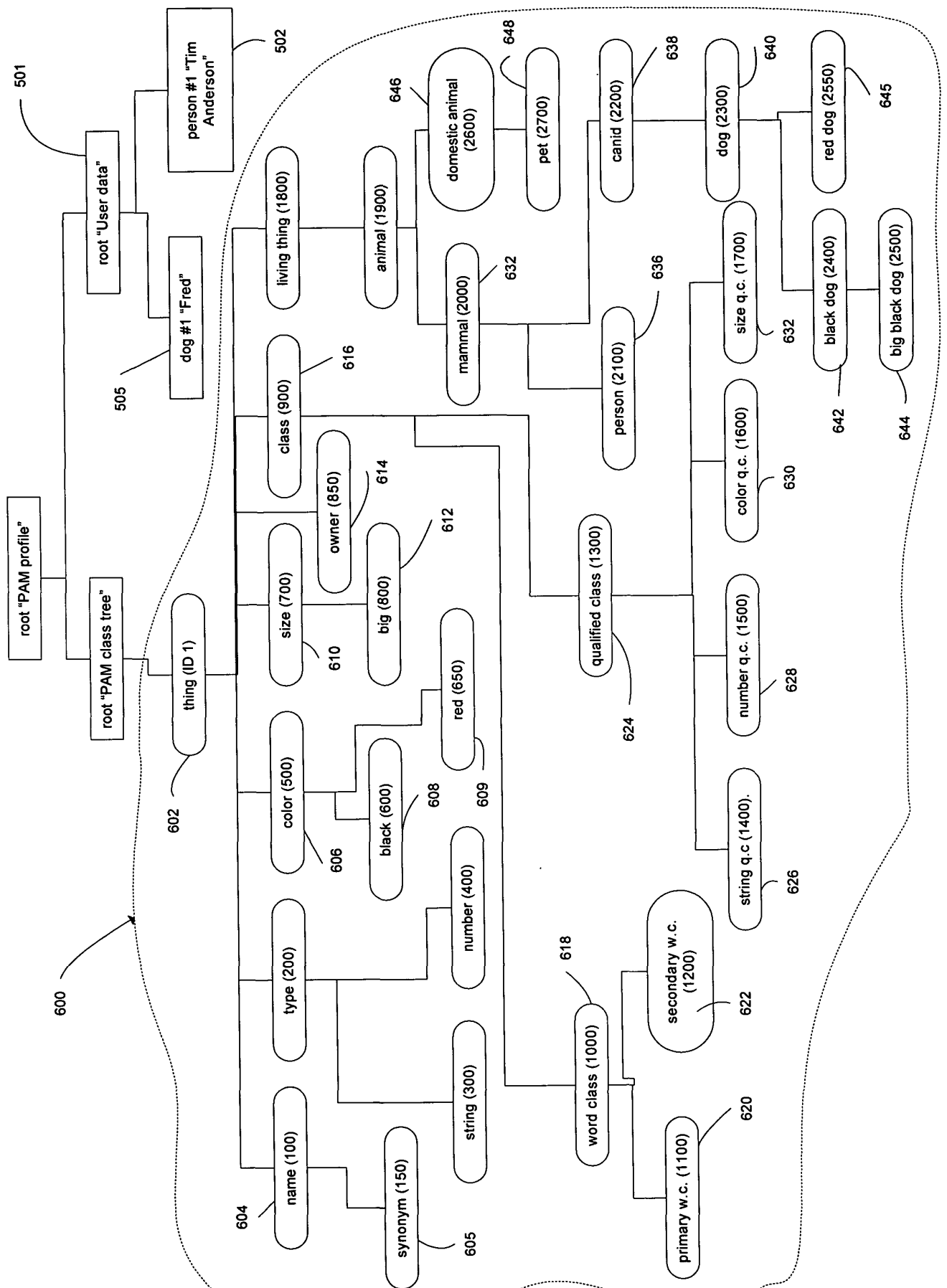


Figure 7

```
root "PAM profile":
  root "PAM class tree":
    thing::
      organization::
        702     employer::
        704     inverse relation: employee
      role::
        706     employee::
        708     inverse relation: employer
      relation::
        inverse relation::
          inverse relation: inverse relation
      person::
        710     parent::
        712     father::
        714     sex: male
        716     inherited inverse relation: parent
        mother::
          sex: female
          inherited inverse relation: parent
        717     inverse relation: son
          target details:
            sex: male
        718     inverse relation: daughter
        720     target details:
        722     sex: female
        724     default inverse relation: child
        726     child::
          son::
            sex: male
            inherited inverse relation: child
        728     daughter::
        730     sex: female
        732     inherited inverse relation: child
        734     inverse relation: father
        736     target details:
        738     sex: male
          inverse relation: mother
          target details:
            sex: female
        740     default inverse relation: parent
```

Figure 8

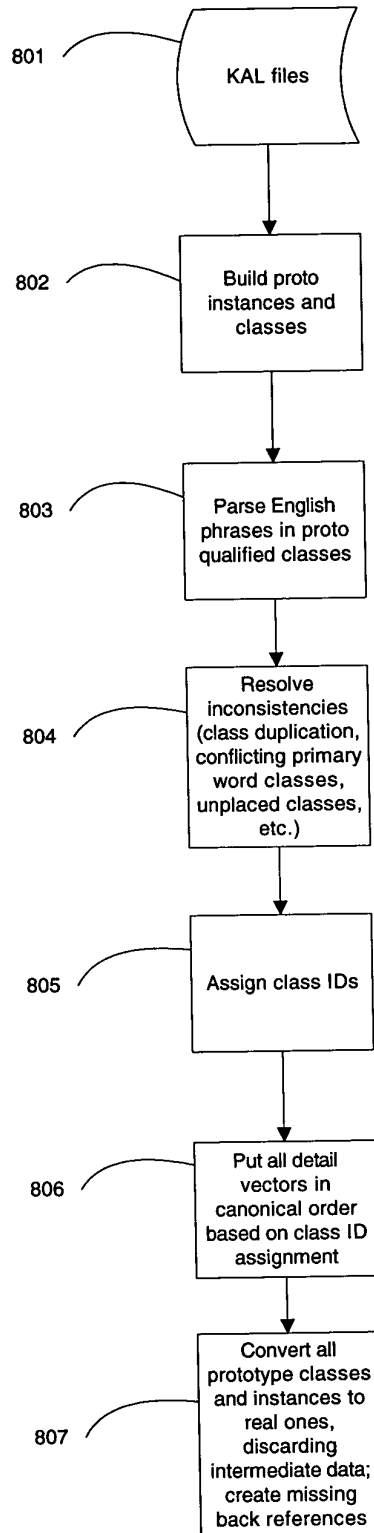


Figure 9

```
root "PAM profile":
  root "PAM class tree":
    thing::
      name::
      type::
        string::
        number@type::
      color::
        qualifier: color
        black::
      size::
        qualifier: size
905      big::
906      synonym: "large"
    class::
      word class::
        primary word class::
        secondary word class::
      qualified class::
        string qualified class::
        number qualified class::
        color qualified class::
        size qualified class::
      action::
901      fly::
      living thing::
        animal::
          insect::
902          fly::
          mammal::
903          canid::
904          dog::
907          big black dog::
908          large black dog::
```

Figure 10

```

root "PAM profile":
  root "PAM class tree":
    thing::
      name::
      type::
        string::
        number@type::
      color::
        qualifier: color
        black::
      size::
        qualifier: size
        big::
      living thing::
        animal::
          mammal::
          person::
          canid::
          dog::
            1006
            big dog::
            1008
            typical instance: big dog #1 "typical"
            1010
            domestic animal::
              pet::
                inverse relation: owner
        root "User data":
          person #1 "Alan Turing":
            pet: dog #1 "Fred"
            1002
            dog #1 "Fred":
              owner: person #1 "Alan Turing"
              color: black
              1004
              size:big
              1012
              big dog #1 "typical":
              1014
              weight: at least 90 pounds
              1016
              big dog "Tiny":

```

Figure 11

```
    root "PAM profile":  
      root "PAM class tree":  
        action::  
1101      fly::  
          living thing::  
            animal::  
              insect::  
1102          fly@insect::
```


Figure 12

```

    root "PAM profile":
      root "PAM class tree":
        thing::
1202         name::
1204         synonym::
1206         variant::
1208         British variant::
1220         first name::
1222         last name::
1224         synonym: "surname"
1210         building accessory::
1212         elevator::
1213         British variant: "lift"
        ...
    root "User data":
1214     person #1 "Alan Turing":
      pet: dog #1 "Fred"
1216     first name: "Alan"
1218     last name: "Turing"
    dog #1 "Fred":
      owner: person #1 "Tim Anderson"
      color: black
      size: big
```

Figure 13

```
    root "PAM profile":
      root "PAM class tree":
        thing::
          vehicle::
1302      car::
          synonym: "automobile"
1304      typical instance: car #1 "typical"
1306      instance model:
1308      important maker detail:
1310      important model name detail:
1312      important year detail:
1314      mileage detail:
1316      color detail:

    root "User data"
1318      person #1 "Alan Turing"
1320      car: car #2
1324      car #1 "typical":
1326      number of wheels: 4
1328      fuel: regular@gasoline
1330      car #2:
1332      maker: Honda
1334      model name: "Civic Hybrid"
1336      year: 2003
1338      color: titanium
```

Figure 14

```
root "PAM profile":  
  root "PAM class tree":  
    thing:: // class ID 1  
1402    A:: // class ID 2  
1404    A [B:1]:: // class ID 3  
1406    C:: // class ID 4  
1408    A [C:1]:: // class ID 5  
1410    B:: // class ID 6
```

Figure 15

software manufacturer "SoftwareCo":
1502 holiday party #5:
1504 calendar time: 7 pm #43
duration: 5 hours
location: hotel #1 "Charles"
1506 holiday #104 "Christmas Day, 2002":
1508 calendar time: day 25 #68
1509 board@group:
1510 meeting #87:
1512 calendar time: 10.5 am #32
1513 duration: 4.5 hours
location: conference room #1 "board room"
1514 calendar:
1516 year 2002:
1518 October:
1520 day 30:
1522 10.5 am #32:
1524 calendar action: meeting #87
1526 December:
1528 day 6:
1530 7 pm #43:
1532 calendar action: holiday party #5
1534 day 25 #68:
1536 holiday #104:

Figure 16

1602 person "Isabel":
1604 typical Monday:
1606 8 am:
1608 calendar action: breakfast
1610 9 am:
calendar action: school
1612 2 pm:
calendar action: ballet
1614 6.5 pm:
calendar action: dinner
1616 8.5 pm:
1618 calendar action: bedtime
1620 typical Tuesday:
8.25 am
calendar action: breakfast
7 pm:
calendar action: dinner
8.5 pm:
calendar action: bedtime

Figure 17

```

root "PAM profile":
  root "PAM class tree":
    thing::
      name::
        synonym::
      type::
        string::
        number@type::
1702      instance type::
1704          alternative value: typical, model
1706      management status::
1708          alternative value: not managed, managed
      living thing::
        mammal::
1710          dog::
1712              model instance: dog #2 "model"
1714          dog:
1716              descriptor: typical
  root "User data":
1718      dog #1 "Fred":
          owner: person #1 "Alan Turing"
          color: black
          size:big
1720      descriptor: managed, primary, happy
1722      dog #2 "model":
1724          descriptor: not managed
```

Figure 18A

1802 car::
1804 instance model:
1806 important maker detail:
1808 important model name detail:
1810 important year detail:
1812 management procedure:
1814 step 1: ...
 step 2: ...

1816 prescription::
1818 instance model:
1820 important medication detail:
1822 important dosage detail:
1824 important frequency detail:
1826 important prescriber detail:
1828 important rx number detail:
1830 important fill date detail:
1832 management procedure:
 step 1: ...
 step 2: ...
 step 3: ...

1834 person #39 "Mary Smith":
1836 descriptor: client
1838 car #77:
1840 maker: manufacturer #57 "Honda":
1842 model name: "Civic"
1844 year: 1998
1846 prescription #18:
1848 medication: drug #56 "Lipitor"
1850 dosage: 10 mg
1852 frequency: daily
1854 prescriber: doctor #91 "John Compton"
1856 rx number: 2461357
1858 fill date: 28 October 2002
 expiration date: 28 October 2003

Figure 18B

1834 person #39 "Mary Smith":
1836 descriptor: client
1838 car #77:
maker: manufacturer #57 "Honda":
model name: "Civic"
year: 1998
1860 management #38:
1862 calendar time: hour #597
1846 prescription #18:
medication: drug #56 "Lipitor"
dosage: 10 mg
frequency: daily
prescriber: doctor #91 "John Compton"
rx number: 2461357
fill date: 28 October 2002
expiration date: 28 October 2003
1864 management #44:
1866 calendar time: hour #241

Figure 19

1900 prescription #1 "Caffeine":
1902 medication: drug #1 "Caffeine"
1904 dosage: 10 mg
1906 frequency: three times per day
1908 prescriber: doctor #91 "Alfred Peet"
1910 rx number: 12345
1912 fill date: 28 October 2002
1914 number of refills: 4
1916 prescription supply:
1918 amount: 20 pills
1920 number on hand: 10
1922 minimum number on hand: 6
1924 prescription consumption:
1926 amount: 1 pill
1928 duration: two months

1930 manage prescription:
1932 task: manage prescription supply
1934 task: manage prescription consumption

1936 manage prescription consumption::
1938 frequency: frequency of prescription
1940 alternative 1: past end of use
1942 effect: stop managing
1944 alternative 2: reminding user to take pill succeeds
1946 effect: decrease number on hand in supply by amount
1948 alternative 3: asking user for confirmation succeeds
1950 effect: decrease number on hand in supply by number reported // believe user

1952 manage prescription supply:
1954 frequency: whenever number on hand decreases
1956 alternative 1: number on hand is less than minimum number on hand
1958 effect: replenish prescription supply

1960 replenish prescription supply::
1962 alternative 1: number on hand will last past end of use
1964 effect: stop managing
1966 alternative 2: number of refills of prescription is 0
1968 effect: get new prescription
1970 alternative 3: try refilling prescription automatically
1972 effect 1: decrease number of refills of prescription
1974 effect 2: increase number on hand by amount in prescription supply
1976 alternative 4: try reminding user to refill prescription
1978 effect 1: decrease number of refills of prescription
1980 effect 2: increase number on hand by amount in prescription supply

Fig. 20A

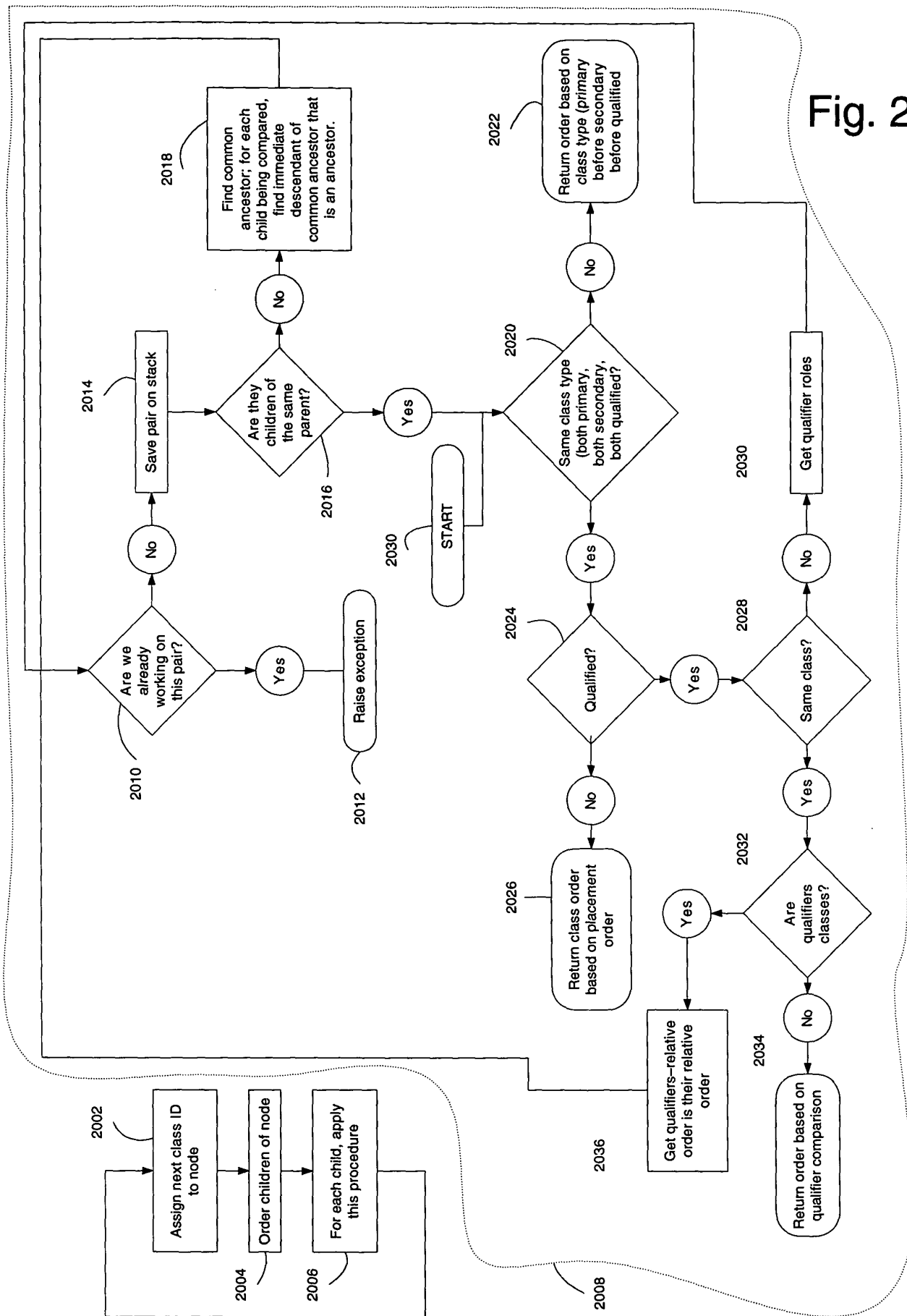


Figure 20B

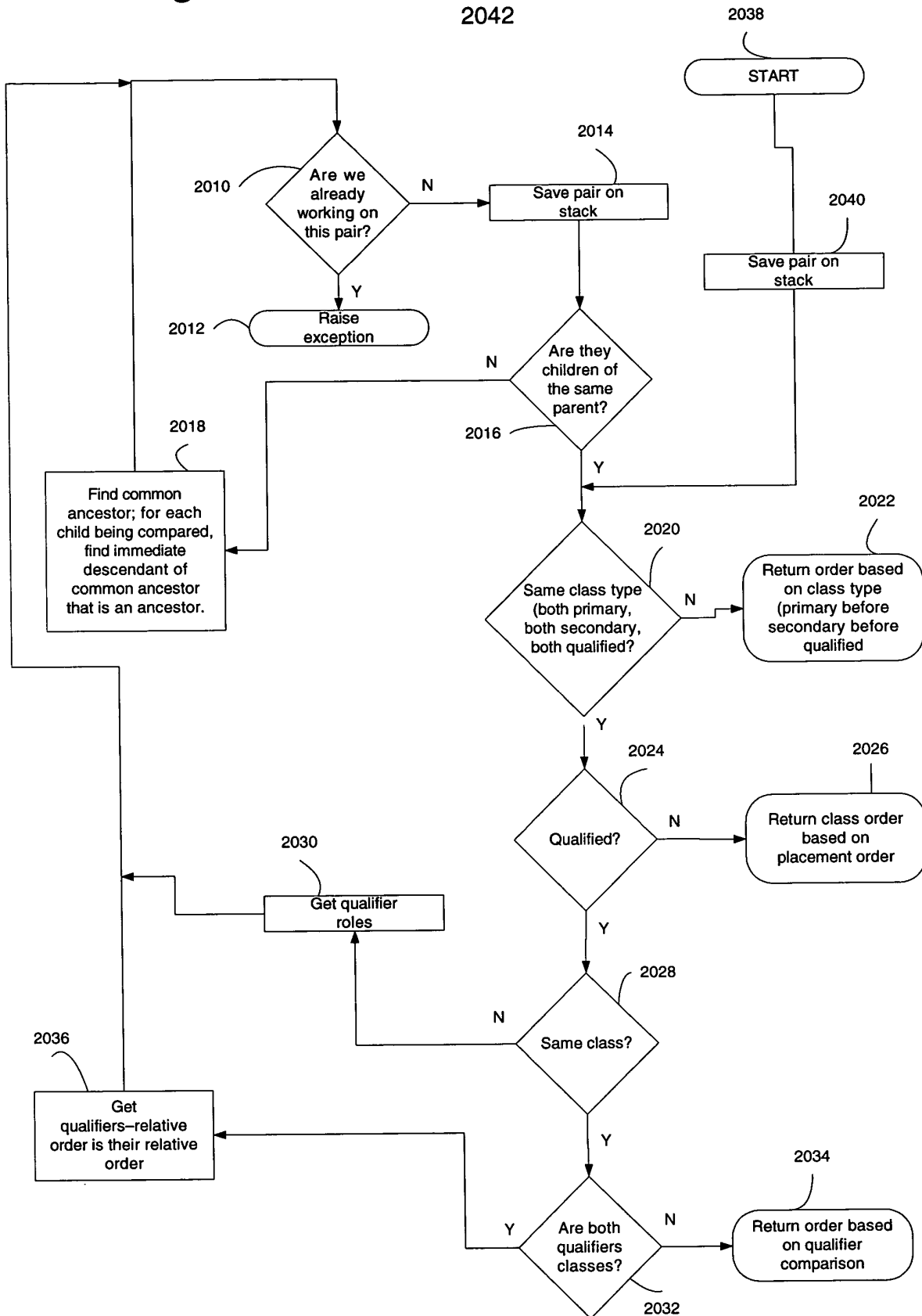


Figure 21

2100	name::
2102	synonym::
2104	word form::
2106	past tense::
2108	plural::
2110	action::
2112	go::
2114	past tense: "went"
2116	bird:::
2118	goose::
2120	plural: "geese"
2122	mammal::
2124	dog::
2126	synonym: "hound"

Figure 22

2200 color::
2202 qualifier: color
2204 black::
2206 size::
2208 qualifier: size
2210 big::
...
2212 primary::
2214 role: importance
2216 secondary::
2218 role: importance